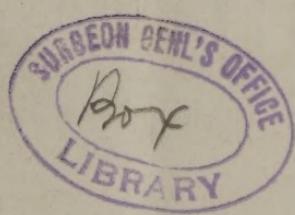
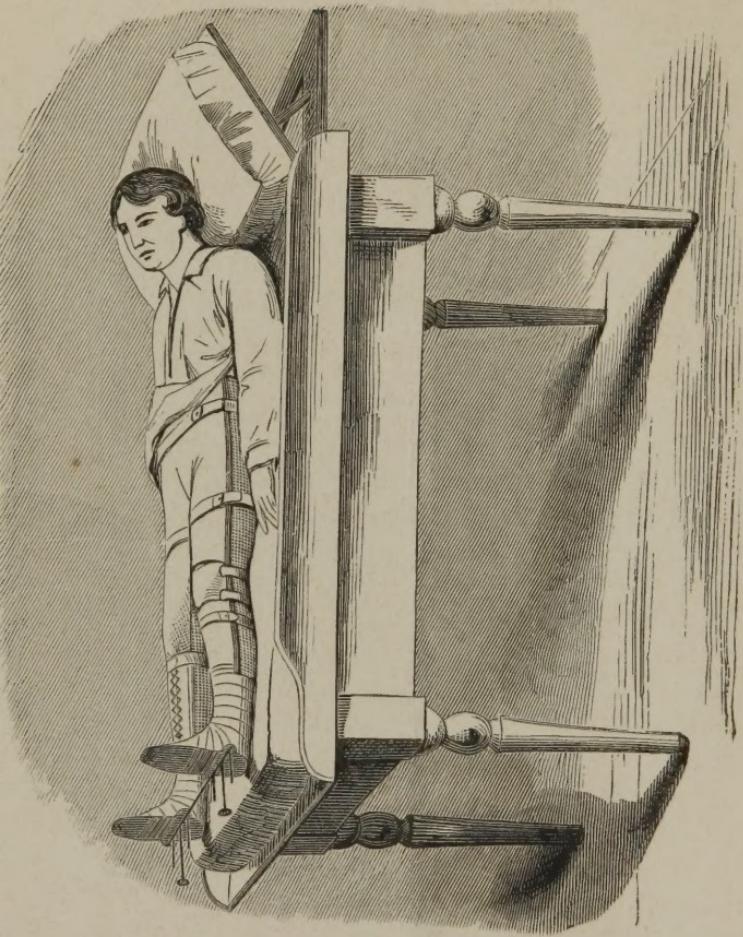


BAUER (Louis)

Hip Disease

Bauer





HIP DISEASE :

A Lecture

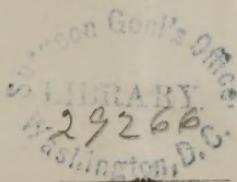
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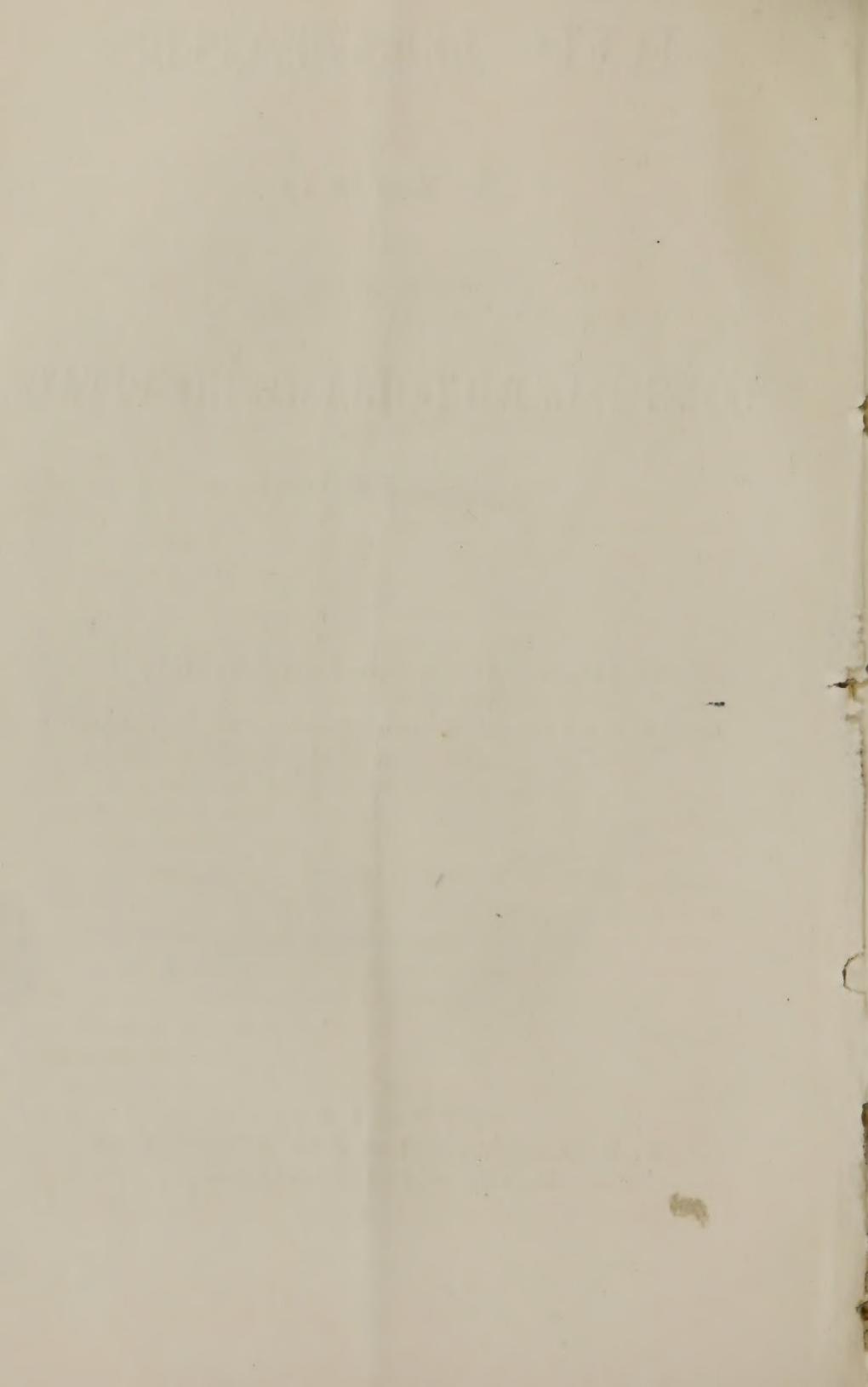
BY

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HIP DISEASE.

GENTLEMEN: Numerous cases of hip disease presented at our hospital and polyclinic, have given ample opportunities of inquiring into its pathology, and of testing the efficiency of our treatment. You have seen the disease in all its phases and complications, from its local commencement to its constitutional termination; you have therefore collected sufficient clinical facts to review some important points intimately connected with our subject. Most cases being still in your recollection, we may dispense with the reiteration of their respective histories; nor need we enter upon details, you being fully conversant with the substance of the subject. Deviations in our present opinions from those propagated some years ago, you will readily recognize as the result of continuous investigation and augmented clinical experience. Looking upon stubborn facts as the only reliable and commanding authority within the compass of inductive science, and claiming no personal infallibility, we shall occupy no time in needless vindication.

Passing over the first stage of hip-joint disease, as not arresting our attention in particular, we may at once proceed to investigate the characteristic phenomena of the succeeding period. As such we have to mention:

1. Immobility of the affected joint.
2. Malposition of the affected extremity.
3. Attenuation of the affected extremity.
4. The peculiar pain.

1. Immobility of the affected joint.—The second stage is, so to speak, initiated by this symptom. In the beginning the immobility may not be perfect and in a certain measure be attributable to volition, yet it very soon becomes obvious that all use of the joint has ceased, and that it has passed beyond the control of the patient. This becomes evident in the act of locomotion, in which the patient substitutes the healthy articulation conjointly with the flexibility of the spinal column, more especially that of the lumbar portion, and they gradually acquire by constant practice such a facility as to delude not only their parents, but even their medical attendants. The true condition, however, will be easily ascertained, when the patient is undressed and moving about; that is, he moves his pelvis in *toto* and not his limb separately.

In order to test the part volition may have in the performance, we need but to place our patient under the influence of chloroform, when it will become evident that both abduction and adduction are impossible, and that but a moderate flexion and commensurate extension are practicable.

2. Malposition of the affected extremity.—In the same proportion as the joint loses its mobility, limb and pelvis assume a very characteristic malposition; the former becoming *flexed* in both hip and knee-joint, and, at the same time, *inverted* and *abducted*; the latter *oblique*, *projected* and turned around its transverse diameter, diminishing its angle of inclination with the horizon.

That these relations are no fictions, but realities, we have repeatedly shown to you with mathematical precision. In placing your patient in the erect posture and dropping a plummet line from the 7th cervical spinous process, and in drawing a line from the ant. sup. spinous process of the ilium to that of the other side, we recognize the declivity of the pelvis in the following facts:

a. Ant. sup. spinous process of ilium stands lower on the affected side; both lines form an obtuse angle instead of a right.

b. The plummet line should fall parallel and in the rima inter nates, yet the latter is oblique and its continuation crosses the former in an acute angle.

c. The inferior circumference of the nates on the affected side is lower than the other.

d. There is a simple curvature of the spine with elevation of one shoulder (affected side).

The flattening of the nates (affected side) has been mentioned as a great pathognomonic sign, yet you will easily understand that it is a mere subordinate, depending chiefly on abduction, but in part on the general attenuation of the limb. The same may be said as to the apparent elongation of the extremity—which is of course the inevitable effect of the obliquity of the pelvis and the abduction of the affected member, and in connection with which the patient assumes a very peculiar walk. He places first his affected extremity forward and outward on the ground, and draws his adducted healthy limb quickly after, shoulder and pelvis (affected side) projecting, so that his walk is actually diagonal.

The question as to the pathological condition of the joint giving rise to the articular immobility and the stated malpositions, is of no ordinary interest, both in a scientific and practical point of view.

Many hypotheses have been advanced, to explain the proximate cause of these symptoms and by men justly esteemed both as practical surgeons and scholars. Yet the confusion and uncertainty seemed to increase with the number of theories until Rust precipitated the vexatious question in his usual dogmatic manner, by cutting the Gordian knot. To review all the hypotheses which have been started from Sabatier up to our time would be of little practical value; they have passed away, and it is but desirable that oblivion should cover the errors of our ancestors. For our age it has been reserved to relieve hip-joint disease from the incubus of individual authority, and to study it anew on the basis of pathological anatomy and stubborn clinical facts.

To Sir Benj. Brodie, is due the merit of having opened the first breach. He not only aided in clearing the road of progress from the rubbish of speculation and fiction, he also taught us to return from the green-room to the dissecting tables and to resume the patient and watchful observation at the bed-side.

The inquiry once started has been kept alive ever since, and the united efforts of zealous students have opened fair prospects of exact knowledge on this hitherto so obscure subject.

The chief cause of error has evidently been the supposition of a *true* elongation where but an *apparent* one existed; an idea of which but few authors could free themselves. Since Goedichen, however, has clearly proved this fact, we shall soon come to a general understanding of those mechanical principles that influence the malposition.

In repeating the interesting experiments of Prof. G. Weber, upon the hip-joint, some few years ago, the analogy of position produced by artificial injection, with that presented by the femur in the second stage, was so striking as to justify the conjecture of equal cause. The conjecture was diligently followed up in our clinical observations and we are gratified in stating that their correctness was subsequently affirmed by facts of indisputable evidence. At first we concentrated our attention upon discerning the presence of fluctuation; indeed, no easy task, the hip-joint being surrounded and covered with muscles, tendons and strong fasciae. But the attenuation of these parts facilitated our object more than we originally expected. We preferred, moreover, those cases in which the malposition and the supposed effusion was greatest. In fine, we placed our patients under chloroform for such examinations in order to render them both painless and more simple. Thus we succeeded in discriminating the presence of liquid along the posterior circumference of the acetabulum, which you have had opportunities of confirming repeatedly. We then went a step farther, in carefully entering the fluctuating joint with a trocar by a valvular opening and *withdrew more or less liquid*, as the case might be. This proceeding, no doubt, will be denounced by some surgeons as reckless and hazardous, but that their fear is totally unfounded (provided it is done to the exclusion of atmospheric air), you can bear testimony. Boyer, Goyrand, and other surgeons, had performed the operation upon the knee-joint with good success, before we ventured upon puncturing the hip-joint. Suffice it to say, that immediately after the withdrawal of the liquid from the affected joint, the limb

could be moved in any direction, *provided that no muscular contractions were present*, and its previous flexed position altered at pleasure. We have thus conclusively proven that the effusion, serous, plastic or purulent, is the proximate and only cause both of the malposition of the affected extremity and the immobility of the joint.

As to the declivity of the pelvis, it can be easily shown that it is but a mechanical sequel of the malposition of the extremity. For if the patient sits down he will always manage to keep the affected side from the chair and place his extremity in a position of abduction. Having done so, the pelvis rests with both tubera ischii on the seat, the spinous processes of the ilium occupy the same height and the curve of the spinal column disappears.

3. *Attenuation of the extremity.*—Attenuation of the extremity is an ordinary sign of hip-joint disease, but not the less characteristic. We see it at the very beginning of the malady and through all its phases. A few weeks will suffice to reduce the circumference of the affected extremity more than 20 per cent. To account for it by supposing want of exercise, or by suppuration, is a vain attempt, since not every patient abstains from his usual walks or ramblings; and not every hip-joint disease is suppurative. Nor would one or the other limit its morbid effects exclusively to the affected extremity. We have, therefore, to look for another interpretation more feasible and rational than the former.

The sudden waste of a single muscle, muscular group or an extremity to the exclusion of other parts of the body, finds no other analogy in pathology than in morbid reflex action. Wry-neck, club-foot or hand, talipes equinus and other deformities, verify the correctness of our views. And in further exemplification, we beg to adduce the following case, that will show the rapidity with which the attenuation may be accomplished.

An Irish laborer received a stab in his back with a dirk near the spine. From the fact that his friends had some difficulty in extracting the blade, which was firmly fixed, we are justified to infer, that it had entered bony structure. The wound subsequently healed up without any untoward symptom. After the

lapse of six weeks, the patient experienced some painful and drawing sensations in one of his calves, which grew in intensity, drawing up the gastrocnemius and soleus muscles, ultimately producing a complete talipes equinus. When the patient soon after came under our care for operation, the circumference of his leg had considerably diminished, so as to bear no comparison with its fellow.

Reflex-action occurs in hip disease in both spheres of the diastaltic system, and manifests itself in retraction of muscles and pain. The former is not as prominent in the second stage as the latter, and we shall therefore consider it more particularly with the third stage of the malady. We proceed to

4. *The peculiar pain.*—A careful clinical observation will readily discriminate two kinds of pain in the second stage of the disease. One that appertains to the joint itself, which is directly connected with the inflammatory and disintegrating condition of the various tissues constituting the articular apparatus. This pain is fixed and unalterable; it varies between the sensation of soreness to a most painful heat, tension and pulsation; it is modified by the progress and regress of the lesion, and is readily perceived by pressure upon the diseased joint and the accidental or intentional motion of the extremity; in one word, it is the attribute of inflammation of the parts themselves, and therefore no subject of special remark. The other pain is of a very different nature, and clinically, not as yet deservedly appreciated. That pain prevails during night, is of an intermittent type, with free intermission, appears with the swiftness of lightning, and seems to terminate near the knee-joint, lasting scarcely long enough to produce a clear perception on the part of the patient or to awaken him to full consciousness.

Nevertheless, when that pain sets in, he will scream out terrifically, and instinctively grasp his knee. The sound thus uttered is as characteristic to this lesion as the peculiar sound in diphtheritic croup; it is indeed most intense, and so loud as to indicate the great agony of the patient. And yet, if you wake him, he can scarcely remember it, and if not disturbed, he will sink back upon his pillow and resume sleep. During

the day, and while awake, he is perfectly free from it; but as soon as night and sleep commence, it will again make its appearance, and last throughout the night. Unless the surgeon has the patient under his own roof, or watches his cases during night-time, he has but rarely the opportunity of observing this symptom in its peculiarity and character, and it is, therefore, erroneously confounded with the ordinary pain accompanying the inflammation of any organ, modified only by the amount of nervous supply.

That this pain is of a reflected character and stands in close connection with the collaterally existing retraction of muscles, can be satisfactorily proven by the division of the latter, which not only removes the pain we have just alluded to, but also arrests the progressive attenuation of the extremity at large, and leads to better nutrition. You have repeatedly observed those effects of myotomy; *they are facts* and no hypotheses. But we shall have to recur to this subject under the head of treatment.

The disease may terminate at this stage of development, in which case the inflammation will gradually decrease, and the effused plastic material organize to fibrous tissue, connecting more or less the corresponding articular surfaces, and leaving spurious ankylosis. The entire resorption of the fluid, although by no means impossible, is in our opinion a rare issue. If it takes place, it allows the supposition that the effused material is of a decided low character, with little or no blastema. And the fatty degeneration of purulent effusion and subsequent resorption is still less to be entertained, as the formation of pus is most usually the result of ulceration of some of the articular tissues.

If, however, the disease steadily advances, all symptoms increase in violence, and the augmented effusion at last perforates either the capsular apparatus or the acetabulum itself. The latter may be apprehended when caries of the acetabulum and ulceration of the lig. teres has been achieved by the disease. The exploratory puncture of the joint and the microscopical examination of its abstracted contents, are excellent auxiliaries in determining diagnosis. The presence of pus, the

looseness of the articulation, and in fine, the crepitus sound on moving, are the most reliable evidences of those conditions. Should the purulent matter emanate through an opening of the capsule, it will lead to the formation of consecutive abscess, the seat of which will of course depend on the location of the former. Posterior perforation locates the abscess either on the posterior or external surface of the thigh, the matter descending below the large gluteus muscle, and collecting more or less below the large trochanter. As all collections of this kind are subfacial, they are by necessity diffuse. In rare instances the matter perforates the joint anteriorly, and in rising, it may destroy the periosteum in its way, follow the course of the ileo-psoas muscles, and form an abscess anteriorly or internally of the thigh. The matter having perforated the acetabulum, most usually ascends and subsequently appears under Poupart's ligament, which may lead to the presumption of psoas abscess.

Very different are the effects in case of perforation, when the effusion is of an organizable constitution. No abscess will ensue, it will be in part absorbed or converted into fibrous tissue, gluing together the muscles, between which it is intersected.

At this juncture, the third stage of the disease commences, and its concomitant symptoms are, comparatively speaking, almost reversed. In order to show the differences existing between the second and third stage, we shall mention them in connection.

SECOND STAGE.

- Limb (apparently) longer.
- “ abducted.
- “ everted.
- “ flexed in both joints.
- Foot touches the ground with sole.
- Toes everted (as in fracture of neck).

THIRD STAGE.

- Limb (apparently) shorter.
- “ adducted.
- “ inverted.
- “ flexed in *hip-joint only*.
- Foot touches with ball only.
- Toes inverted as in post. sup. luxation.

SECOND STAGE.

THIRD STAGE.

Pelvis lowered.	Pelvis raised.
“ projected forward.	“ projected backward.
“ angle of inclination acute.	“ angle of inclination almost right.
Nates low and flat.	Nates high and round.
Linea inter nates inclined towards affected side.	Linea inter nates deviates from affected side.
Spine on affected side curved.	Spine on affected side concave.
Pain most intense.	Pain greatly diminished.

Whilst the perforation of the walls and the termination of hydraulic pressure (at least to our mind) satisfactorily explains the change of symptoms in one point, it still leaves the question open for discussion, by what means the new malposition of the affected member may be acquired. The old school has an answer in readiness, viz., “spontaneous dislocation.” But ten years ago, ostracism and contemptible sneer would have been the inevitable lot of a surgeon who dared to doubt the doctrine that had been generally received as a settled truth. Happily, the time when individual authority was permitted to convert fiction and hypotheses into facts by abstract arguments and dictation has passed by, and we imagine never to return. But the number of adherents to that obsolete and fictitious doctrine is yet respectable, and we may, therefore, be of some service to the cause of truth, in discussing more fully the question of spontaneous dislocation, than we otherwise might have desired. We have two ways of doing so, first in clearly demonstrating the error, and second in bringing forth the facts in positive proof of modern teachings.

The doctrines of the late Prof. Rust on this subject were exceedingly plausible, and as his disciple, we were fully initiated in them, and defended them with ardor whenever an occasion might offer itself. What was simpler than enlargement of the caput femoris as a cause of elongation, and what more conclusive than a final escape of a bone that had no more room in its respective socket? And allowing the margin of the acetabulum to be carious, soft and destroyed, and the muscles retracting, we had all the premises for spontaneous dis-

location. The convexity of the nates, the inversion and shortening of the extremity, left no further doubts. The scale of argument turns, however, very soon, in establishing the fact that effusion into the articular cavity and hydraulic pressure upon the femoral head are recognized as causes of elongation. Thus the premises are effectually removed, and the inference rests on no foundation. But supposing, for the sake of argument, the femoral head to be enlarged either by tuberculous deposit or central caries (myelo-ostitis), it would of course ulcerate and destroy the lig. teres, and likewise soften, flatten and mould itself to the acetabulum, but in no way elongate the member; or it would not ulcerate, and in this case, the mere integrity of the lig. teres would effectually prevent its being dislocated. This, however, refers but to the preceding period, and not to that in which the extremity has already assumed a position simulating dislocation.

Judging from the numerous victims of hip disease found in our public thoroughfares, cases of so-called spontaneous dislocation are, unfortunately, frequent enough. Yet in searching anatomico-pathological collections, specimens of that description are rather scanty. The several pathological museums of London, the Hunterian included, have but comparatively a few presenting the conjoint evidences of both hip disease and dislocation upon the ilium, and in the United States we may almost enumerate them, so insignificant is their number. Prof. Gibson, formerly of Pennsylvania University, had the kindness to show us quite a number of specimens, referring to hip-joint disease, and there was but *one* dislocation, and even that showed no traces of hip disease. That it had been the result of *morb. coxarius*, we have no doubt, since we have the word of the venerable Nestor of surgery for it. Our distinguished friend Prof. Mussey, is in the possession of one of the best and most complete collection of specimens, yet there is among them but one that could be accepted in favor of dislocation after hip disease. A third was shown to us at St. Louis, by Prof. Pope, said to be taken from a patient suffering both from hip disease and typhoid, in the course of which dislocation took place, without any traumatic cause whatever. Thus much for

pathological anatomy. Rust himself, however, has never laid before the profession any evidence sufficiently strong to carry his point. At any rate, the three cases he advert's to in his work on "Arthroacacology"/* have not, and never could be admitted as the basis of his doctrine. In a girl twelve years of age, suffering from coxalgia of the 1st degree, and who had died from pulmonary tuberculosis, he remarks: "I found the head of the femur expanded, deeply pressed down, and in part out of the acetabulum. The two other cases only represent caries of the neck, one with a flattened head without enlargement, the other entirely separated from it, but retained in the socket. The theory of spontaneous dislocation is essentially based upon the supposition of caries of head and acetabulum, yet a large proportion of hip-joint disease, with high and even the highest degree of malposition and shortening, has never advanced to caries. Again, in applying Nélaton's test, by drawing a cord from the tuber ischii to the sup. spin. process of the ilium we usually cross the very apex of the large trochanter, which should stand far above if dislocation had taken place. Moreover, the average shortening of traumatic dislocation upon the ilium (sup. post. dislocation), is one and a half inches, whereas the average shortening in the third stage of hip disease, the supposed spontaneous dislocation is at least three inches. Are we to believe that a muscle has a greater effect than external violence upon a perfectly healthy and well-secured joint? But, gentlemen, we feel it incumbent upon us to arrest here our criticism, and to proceed at once to the positive proofs of a different interpretation for the malposition and shortening. We do not, however, wish to be understood, that we altogether negative the possibility of dislocation of the femur in *morb. coxa-rius*, for this would be folly in the face of indisputable facts. For, if a healthy femur may be dislocated, decidedly an affected one can, when the anatomical conditions are every way more favorable. All we wish to say is—

1. That dislocation, consequent upon hip-joint disease, is not by the hundredth part as frequent as presumed, and

* *Arthroacacology, oder die Verrenkungen durch innere Bedingungen.* Wien, 1817, pag. 17.

2. That dislocation cannot take place without additional traumatic cause, however trifling, which in our opinion dissolves the ontologism of the term "spontaneous dislocation."

How rarely, even under the most advantageous circumstances, dislocations occur in this malady, the case which we have published in the NEW YORK JOURNAL OF MEDICINE (vol. xii., new series), and to which we invite your attention, will strikingly illustrate. In presenting to you the cast of the patient, and calling your attention to the considerable convexity of the right nates, we may briefly state in addition, that in this case we found, on post-mortem examination,

1. Enlargement and softening of the caput femoris.
2. Considerable enlargement of the acetabulum, with caries and total destruction of cartilage.
3. Perfect solution of the continuity of the femur by caries, immediately below the small trochanter.
4. Perforation of the capsule.

Hence all that was calculated to favor displacement, but we did not find dislocation.

The specimen referred to being deposited in the museum of the College of Physicians and Surgeons of New York, may at any time be examined, and our statement thereby verified.

The chief error at the basis of this false theory of spontaneous dislocation, is the presumption of a true shortening where none exists. By this preconceived opinion the collateral symptoms were entirely disregarded, though they would have satisfactorily explained the mechanical conditions, without grasping at the untenable doctrine of spontaneous dislocation. Sapienti sat.

Gentlemen, Prof. Bonnet, of Lyons, a scholar and clinical teacher of great merit, and who has greatly advanced our knowledge on joint diseases, has clearly demonstrated that the mere turning of the pelvis on its longitudinal axis will produce an apparent shortening of the thigh of about an inch. Of the correctness of that observation, we may convince ourselves at this very moment, by imitating the motion. In placing ourselves on this chair, you notice that our knee-joints are perfectly parallel, and the thigh of equal length. By twisting one side

of our pelvis backwards, whilst the other, of course, turns forwards, you observe that one recedes an inch from the other. This is one of the mechanical conditions noticed in the third stage of the disease. Another, equally imitable, is the declivity of the pelvis, by which one side is raised above the other from two to more inches; the permanent flexion of the thigh upon the pelvis accounts for the difference.

As in the second stage, the pelvic declivity, the spinal curvature, and the different height of the shoulders disappear forthwith, when the patient assumes the sitting posture, thus conclusively demonstrating the consecutive nature of those deformities.

In placing the patient perfectly straight in the recumbent position on a board, we notice that his affected extremity is greatly adducted, and that its axis forms an acute angle with the transverse diameter of the pelvis. Abduction, being opposed by the contraction of the entire group of adductors, can be effected only by raising the pelvis, and extension, being equally resisted by the permanent shortening of the flexor muscles, can be effected only by the anterior inflexion of the spine and the greater inclination of the pelvis. It is self-evident that no patient could walk with crossed legs, as the mal-position would imply, hence he has to compensate one deformity by another. In order to swing his extremities parallelly, as indispensable to locomotion, the patient abducts his healthy leg and raises and voluntarily inclines his pelvis, as much as sufficient to accomplish his task.

The idea, gentlemen, that the contractions of the adductor and flexor muscles are of a voluntary nature, is entirely inapplicable, since even the most profound anaesthesia is not capable of subduing them. Their tension requires the knife, and division alone can overcome them. This operation, and its effects upon the malposition, have been repeatedly witnessed by you. Thus by arguments demonstrated to your physical eye, we have proven that the deformities and shortening depend on no other cause than the reflected contractions of muscles.

The last stage of hip-joint disease comprises, in one respect, the final settlement of all malposition, the healing of caries, and

the closing of fistulous openings; in another the progress of carious disintegration and hectic. Those points may safely be referred to general surgery, requiring no special comment.

Differential diagnosis.—The discrimination of hip-joint disease from other relative difficulties is not as easy as might appear. In the course of our practical career quite a number of diagnostic errors have come to our knowledge, committed in part by men whose sagacity and acute observation are too well known to be questioned. In one instance, the hip-joint of the healthy extremity had been touched by actual cautery, because it was adducted, whilst its abducted fellow was the real sufferer. Diastasis of the head, and fracture of the neck, are not rarely mistaken for *morb. cox.*, to the prejudice of the patient, and so forth. You will therefore find the following tables of service to you.

FRACTURE AND DIASTASIS OF HEAD.

- Produced suddenly,
- Eversion of limb,
- Shortening of limb,
- Straight limb,
- Loose articulation,
- Straight pelvis,
- Crepitus,
- Spine vertical,
- Shoulders square,
- Nélaton's test (apex of large trochanter above the line).

SECOND STAGE OF MORB. COX.

- Growing comparatively slowly.
- Eversion and abduction of limb.
- Apparent elongation of limb.
- Flexed in hip and knee.
- Fixed hip-joint.
- Oblique pelvis.
- No crepitus.
- Spine curved.
- One shoulder higher.
- Nélaton's test (trochanter below the line).

These differential symptoms exclude, of course, the impacted fracture.

Dislocation of the Femur.

1. ANTERIORLY AND SUPERIORLY.

- Suddenly produced,
- Extremity much everted,
- Immobility,
- Moderate shortening,
- Abduction,
- Head can be felt in the groin.

SECOND STAGE OF HIP DISEASE.

- Comes gradually.
- Less everted.
- Immobility.
- Apparent elongation.
- Abduction.
- Head cannot be felt at all or very indistinctly, and then at the acetabulum.

2. POSTERIOR SUP. DISLOCATION.

Produced suddenly,
 Limb shortened and inverted,
 Adducted,
 Immobility of articulation,
 Flexion at the hip,
 Moderate shortening,
 Head most usually felt under the glutæus maximus muscle,
 Apex of large trochanter above Nélaton's line,
 No stationary contractions of muscles,
 Pelvis square,
 Walks with healthy leg bent,
 Touches ground with almost entire sole,
 Spine straight,
 Angle of inclination of pelvis unchanged.

POTT'S DISEASE AND PSOAS ABSCESS.

Preceding pain in the spine,
 Posterior and anterior deformity (not always),
 Simple flexion and shortening of limb,
 Limb may be extended under chloroform,
 Pelvis square,
 Nates even,
 Cannot walk except with support of spine by resting hands on knees,
 Abscess under Poupart's ligament,
 Hip articulation free,
 Slight retractions of flexors,
 May have signs of paraplegia.

THIRD STAGE OF MORB. COX.

Growing gradually.
 The same.
 Same.
 Same.
 Do.
 Apparent shortening considerable.
 Head not felt at all.
 Below or even with Nélaton's line,
 Permanent contractions of flexors and adductors.
 Pelvis raised and oblique.
 Healthy leg straight.
 Only with the ball of the foot.
 Spine flexed laterally and anteriorly.
 Angle of inc. of pelvis increased.

THIRD STAGE OF MORB. COX. |

Preceding pain in the hip-joint.
 Lateral and anterior deformity.
 Flexion, adduction and inversion.
 Cannot.
 Pelvis oblique.
 One higher.
 Can walk, and without these precautions.
 May have the same.
 Almost fixed.
 Fixed contractions both of flexors and adductors.
 Has none.
 Order of development by far different. The perforation of acetabulum may be ascertained by anal exploration.

PERIOSTITIS OF FEMUR.

Mostly commences suddenly,
 Femur more or less enlarged,
 Femur painful on pressure,
 Joint free,
 Extension and abduction impeded,
 Joint painless,
 Pelvis oblique and spine curved,
 Contraction of flexors and adductors.

THIRD DEGREE OF MORB. COX.

Grows gradually out of preceding stages.
 Not at all.
 Not in the least.
 Almost fixed, and when moved often crepitus.
 The same.
 Painful on pressure.
 The same.
 The same.

These are the chief instances that may present some diagnostic obstacles, and we have indicated the basis on which they may be distinguished one from another. It need hardly be mentioned, that the correct diagnosis is of the utmost vital importance; as for instance, in fracture. A little patient was brought to us from Demopolis, Alabama, with alleged morb. cox., with a seton at his joint. Careful examination revealed fracture or diastasis of the neck. Against all odds and anticipations we succeeded in relieving him by rubbing the fragments upon each other, creating thereby the required inflammatory action of the parts, and subsequently putting him in our wire apparatus. Upon another case we have performed resection of the carious neck of the femur, which in our opinion resulted from an unnoticed fracture or diastasis. The same importance may be urged in relation to periostitis; for a simple incision down upon the bone may relieve your patient at once, and protect him against scores of troubles and dangers by an early and correct diagnostic discrimination, as the case in Ward No. 3 of our hospital illustrates.

Aetiology.—During the last few years we have been in the habit of taking notes of our patients, more particularly of those suffering from hip-joint disease. The number of the latter thus recorded amounts to eighty-seven, fifty-eight of whom were boys, their respective ages varying from six months to sixteen years. In seventy-one of those cases traumatic occurrences preceded the disease; in some they could be but imperfectly ascertained, and in ten, accidents were totally denied. We have

taken more than ordinary pains to elicit these facts, as the generality of surgeons are strongly inclined to ignore them entirely, and to set the causes down as scrofulous. To deny the influence of a perverted constitution, or the participation of a low organization of nutritive fluids in the establishment of bone and articular diseases, would be, to say the least, a grave error. But it is just as contradictory to look upon every articular disease as constitutional and specifically scrofulous. Our clinic has exhibited to you a number of patients, whose countenances presented the very picture of health, and whose parents or ancestors, as far as could be traced, had been of good and robust constitution. Mary Tuthill is an instance of that kind. Again, we know for certain, that in many instances the patients had been perfectly well and healthy previous to the accident that brought the trouble upon them, and that from that time only, they failed, becoming anaemic, attenuated and prostrated. Thus it seems as if constitutional troubles were rather the *effects*, instead of the causes. Moreover, we see the same patients improve both in appearance and weight, merely by restoring appetite, rest and comfort to them. You can bear witness to the fact, that this result has been repeatedly attained in our Institute, merely by local appliances and without a grain of medicine.

We are therefore fully justified in asserting, that a large proportion of hip-joint cases is of mere local origin, and that, in all probability, but a small fraction can be ascribed to constitutional or scrofulous causes.

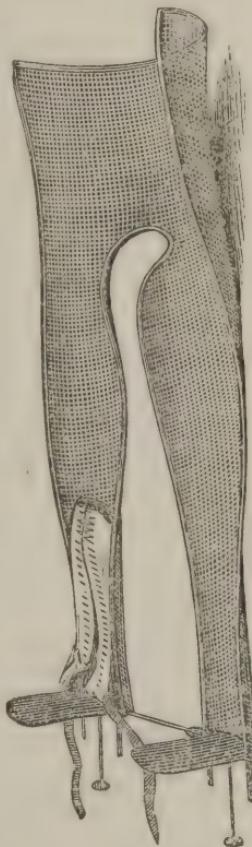
Prognosis.—*Morbus coxarius* has hitherto been considered one of the most obstinate affections human flesh is heir to. This opinion alludes both to the danger of the disease itself, and to the negative results of treatment. The ordinary experience tended to show, that the disease, having once fairly commenced, would take its course, despite the best medical treatment and diet; and its termination at an early stage would be set down as an unexpected, but happy exception. It is, therefore, no wonder, that medical men were not very anxious to take charge of the like cases, and still less to make them an object of their special attention. As far as the old treatment

is concerned, this is undoubtedly correct, for no change for the better could be counted on with any degree of certainty. Upon this gloomy aspect we are happy to infuse some cheer. The treatment adopted by us is calculated, not only to relieve our patients in as far as comfort and immunity of pain are concerned, but also to arrest the progress of the disease. And though it has its limits beyond which we can do little or nothing, yet its results have already altered the feature of prognosis for the better. We need not state that the earlier stages of *morb. cox.* allow more hope than the latter. Whilst the first stage would be but a trifling object for sensible treatment, the second already constitutes a grave malady.

But more decisive than the form is the morbid condition of the joint upon prognosis. Suppuration of any tissue of the joint implies progress of the disease, and caries, or perforation of the acetabulum are highly dangerous and but too often fatal. Bad constitutions, anaemia and emaciation in conjunction with caries, are almost certain death.

Treatment.—The treatment hitherto, and we apprehend still, pursued in hip-joint disease, is, to say the least, very deficient and unreliable. Honest and unbiased surgeons will admit this. The idea that this malady is of a specific dyscrasie character has been disastrous by slighting the importance of local appliances. For many years have Dr. Physick, Sir Benj. Brodie and Prof. Bounet of Lyons, inculcated the rule of rest for joint diseases, and yet how few surgeons have followed suit. A most dangerous and culpable indifference to this imperative maxim has widely spread, and those may be even sneered at and set down as charlatans who dare to deviate from the orthodox plan of “*laissez moi.*” Some surgeons have even the coolness to eulogize as “*CONSERVATIVE SURGERY*” that treatment which sends cripples into the streets and scores of victims to the grave. As a consequence, the man opposing this sort of treatment, which speaks volumes of self-condemnation, becomes the object of derision and is characterized as a “most dangerous, revolutionary and daring innovator.” Truly, more moral courage is required, to shape a new course of any human pursuit, or to assume an independent position, than the

mere acceptance of established doctrines ; and, perhaps, forbearance is the least that such a man should expect from his co-laborers in the service of science and suffering humanity. One of the first axioms in the treatment of *morb. cox.*, is *rest*, and the next is insuring a good position to the affected extremity. The earlier this is done the better. The whole antiphlogistic apparatus, combined with the best constitutional treatment and nursing, are not to be compared with the therapeutical effects of simple rest and proper position, and to use the words of a young medical friend, "they act like charms." It is very evident, that the recumbent position in bed is not the thing. It leaves the patient subject to accidental movements of his limb, and does not prevent malposition. In order to accomplish both, various means have been devised. Physick used his carved wooden splints, Brodie leather, Alden March cloth impregnated with glue, Bonnet his so called "great apparatus." With the exception of the last, we have tried them all, and in addition, Hagedorn and Drondi's machine; but their inefficiency has induced us to construct another, which a wagish medical confrère has christened the "wire breeches." It consists, as you perceive, gentlemen, of a frame of stout wire, filled with wire cloth. In order to solder one to the other, they should be galvanized with tin. An opening is left for the anus. At the lower end two foot boards are movably fixed, so as to change the length of the apparatus and exercise any amount of extension, the counter-extension being procured by the healthy extremity and in part by the tuber ischii. The whole should be varnished for the purpose of protecting it against rusting. The



apparatus being well filled with cotton, the patient is placed within and fastened by bandages. If extension should be decided upon, you may surround the leg with a loose stocking, or fasten it directly to the footboard by adhesive straps, as in fracture. Thus securely placed, the patient enjoys the most perfect rest of his joint. He may be carried from one place to the other, or his alvine evacuation may be attended to, without disturbing his comfort or position.

In the first stage of the malady this will be amply sufficient to check the disease and to prevent further mischief.

In the succeeding period, the therapeutical indications are more diversified. We have to contend :

1. With a higher grade of inflammation, having already terminated in effusion, of various kinds.
2. With malposition, opposing more or less the proper placing of the affected extremity.
3. With most painful nocturnal pains, threatening to annihilate the patient in the shortest possible time.

As to the existing inflammation, it is but natural that the antiphlogistic method should have been employed, but we apprehend, without avail or benefit. We have fairly and repeatedly tried its efficacy, without the desired result. All we have retained of it is local depletion, by means of leeching or cupping behind the joint. But even on them, you cannot count with any degree of certainty, nor will their benefits last more than perhaps 48 hours.

Next in order comes the derivation in its various forms of blister, seton, issue, moxa, actual and potential cautery, etc. The use of these means is certainly calculated to render the poor patient still more wretched. You inflict additional pain —you interfere still more with his comfort, and you increase the drain upon his system. They, moreover, constantly require cleaning and daily dressing, which again interferes with the quietude of the joint. And, in fine, their efficacy is, to say the least, questionable. At any rate, we have never derived the least benefit from their faithful and systematic use, nor has it come to our knowledge that other surgeons have been more successful. Nélaton, Syme, and Bonnet, advocate still the so-

called linear application of hot iron over affected joints, yet they have not asserted that that remedy is so indispensable either, nor that they chiefly rely on it. We have dispensed with the entire class of derivatory appliances, and we firmly believe that our patients have fared the better for it.

But what shall we do with the effusion in the joint? If it is of a plastic character and small amount, we may leave it to resorption, and if it should organize and cause fibrous adhesions between the corresponding articular surfaces, it would matter but little, since we have it in our power to break them up again and to re-establish mobility. Occasional motion of the joint in the process of their formation may even prevent them effectually; this should be done, however, with great discretion, and not before the inflammation has abated in some degree. A considerable quantity of effused material is not only a great impediment to the restoration of the position of the extremity, but it is in some respects the means of continuing inflammation by keeping up the distension of inflamed tissues. *With the quantity of exudation, the degree of malposition and the violence of symptoms correspond.* In order to relieve both, we have to withdraw it. We may do this in two ways, with knife or trocar. A straight and pointed tenotome is flatly inserted behind the joint, then so turned as to penetrate the capsular ligament. The wound of the latter should be at least a quarter of an inch long, so as to facilitate the escape of the fluid. Whilst this is being done, the extremity should be inverted, so as to diminish the size of the articular cavity, which has the effect of driving all liquid out. The punctured wound should, in fine, be carefully closed with adhesive straps, and the limb fastened in the wire apparatus. We should proceed in a similar manner with the trocar, with this difference, however, that the canula remains in the joint until the limb has been inverted. The limb should be kept in this position until the canula has been removed, the wound closed, and itself fastened down in the wire breeches, otherwise the formation of a vacuum would invite the air to rush in and cause mischief. The exact place to enter is to be determined by the fluctuation, mostly an inch posterior and superior to the large trochanter, where the

joint is but little covered with adipose tissue and fascia. We prefer a fine trocar of about a line thick to the knife, as you are more certain in its handling and as you can see the contents withdrawn, which will not only perfect your diagnosis in reference to the actual condition of the joint, but will also guide you in determining the plan of treatment afterwards to be pursued.

If the retraction of muscles oppose the proper placement of the extremity, they should be divided previous to the puncture of the joint. We mostly find the tensor fasciæ latæ, and only occasionally the adductors involved. The operation is but trifling. The pelvis of the patient should be firmly fixed, and the limb well extended by assistants. This raises the muscles from the subjacent parts. In pressing the knife through from without to within, we are certain that all fibres are divided, and that no important parts are injured. The tensor we divide about an inch below the sup. ant. spin. process of ilium, and the adductors at about the same distance from the pubic arch.

We have performed puncture of the hip-joint about 50 times, mostly with signal relief, and at no time with disagreeable consequences to the respective patients, whereas the subcutaneous division of those muscles has been very frequently resorted to. We do not pretend, gentlemen, that puncture or myotomy, by themselves, cure hip-joint disease, or have any direct influence upon the disintegrating process of the bones ; but our daily observation teaches us, that they are the most valuable and indispensable remedies in its treatment. What *no other* therapeutical agent can do, they will accomplish. In the first place, they render the quietude of the articulation and proper position of the extremity possible ; they alleviate not only the pain of the joint itself, but remove in almost all instances that characteristic nocturnal pain which rapidly consumes the strength of the patient. It improves the form, and if the disease has not proceeded too far, having caused already ulceration and caries, it will even check its progress. Our confidence in myotomy is so unbounded as to decline the charge of any articular disease with the exclusion of that remedy, and in no disease is it more reliable than in those of the hip and knee-joint.

The rest and painlessness thus attained, the patient begins to improve, to increase his weight, to look better, and to become cheerful. The wire apparatus is indispensable to his comfort, and he solicits to be replaced, if it should have been deemed necessary for the sake of cleanliness, to remove it. The apparatus must remain applied until the joint has become almost painless, when the patient may be permitted cautious locomotion, upon crutches, supported by a framework moving upon four wheels. That the patient should receive the best of air, of food, and of such remedies as his case may otherwise require, is a matter of course.

The objection has been raised against this treatment, that the confinement was highly prejudicial to the general health of the patient. This is, however, not the case, as you will readily observe in the blooming appearance of our little patients in the hospital.

And if it is, even, in a certain measure detrimental to the system, which we do not at all admit, it would certainly be the lesser of two evils. The same argument might as well be applied to fracture of the leg, and yet, nobody can treat such patients without the inconvenience of confinement.

In a few instances, myotomy not only failed in relieving, but rather seemed to aggravate the sufferings. This was found to be due to imperfect division. But in *one case*, that of Richard Trottman, the division of all contracted muscles, did not give the desired relief. Anodynes and narcotics of every description were tried in vain. Morphine in pretty large doses, neither allayed the pain nor secured rest. In combination with strychnine, however, it had instantaneous effect.

The course of gradual improvement is occasionally, though rarely, interrupted by new inflammatory attacks. A few leeches or cups will generally suffice to meet the case.

But, gentlemen, if suppuration of the joint has been made out, the question rises, whether the soft parts are exclusively involved, or whether it extends to the osseous tissue. The former, we may infer from the fact, that the fluid removed from the joint contains but pus, and no detritus, or traces of osseous or cartilaginous structure, and that the moving of the joint reveals

no crepitus. If this be the condition in which we find the joint, we can lose nothing in observing the rules previously given for treatment.

It should be recollected, however, that suppuration very soon involves the osseous and cartilaginous structure, and therefore frequent though careful examination should be made in order to ascertain the actual condition of the joint.

Having discovered, that the hard tissues of the joint have at last become disintegrated, the question rises, how to meet the altered condition ?

We should advise to maintain perfect quietude of the joint, good position of the extremity, free discharge of matter, and to sustain the system by all possible means. Thus we may succeed in overcoming limited caries, and eventually accomplish the restitution of the bone with ankylosis. Whether it be advisable to inject the joint with a diluted tincture of iodine, as Nélaton suggests, or whether the internal administration of phosphates will facilitate the restorative process, we must as yet leave undecided for want of personal observation.

If, however, the caries advances, and the drain upon the system becomes more manifest, the question rises, whether it be advisable to tender artificial aid in removing the diseased bone, and give the patient a fair chance of recovery. This question has been variously answered by different surgeons. Those who contend that the disease is of an exclusive scrofulous character, are consistently disposed to depend exclusively on constitutional treatment; others advise the free opening of the joint (John Gay); and some advocate the entire removal of all carious portions, at one stroke.

The first class of surgeons has had sway for about a century. Their results are indeed very unsatisfactory, even to themselves. The mere opening of the joint without removing all detritus seems to be inefficient. Whilst it does well in small joints, in those immediately under the skin, and where the matter may easily issue (as at the elbow joint), it is not so applicable to the hip-joint, at least as far as our experience goes.

There is another disadvantage; simple incisions close very soon, and whilst the wound is open, the air also acts upon the

healthy parts of the joint, tending to spread the disease. A few successful cases in our hands can not compensate for losses we have sustained.

We therefore join those surgeons who freely open the joint, and at the same time remove all diseased parts of bone. It is hardly necessary to offer arguments in favor of this operative proceeding, since nature adopts the same principle, though in a different and less decisive way. Where the joint suppurates, the perforation is inevitable, and where bones are disintegrated, she removes them in small fragments. The views as to the time to operate, also differ among surgeons.

Some wait until suppuration has prostrated the system, or symptoms of pyæmia manifest themselves. We believe that the operation should be performed as soon as the fact has been clearly established, that the head of the femur and a part of the acetabulum are diseased to any extent. To hope, under such circumstances, for spontaneous repair of the diseased structure is at best vain; whereas it seems certain, that the very contact with a decomposed, purulent fluid, is of itself sufficient to spread the disease. An early operation stands therefore the best chance of success.

We have performed the exsection of the head of the femur, and part of the acetabulum seven times, and have aided in one. Four died many months after the operation, one of diphtheritic croup, two of convulsions, and one from exhaustion. In none was the post mortem permitted. The respective wounds remained open, and continued to suppurate until death. In two that died, perforation of the acetabulum existed previous to the operation, and the latter was resorted to as *ultimum refugium*. Four cases recovered, including the case of our esteemed friend Dr. Lewis A. Sayre. The second was that of Mary Johnston of Cincinnati; the third was that of Michael McCarty of Portland, Connecticut, and the fourth was that of Fred. C. Schroeder, still in our hospital. The experience we have derived from these cases, strengthens our hope for better statistics in the future, and the construction of our "wire breeches" has turned out to be a most serviceable auxiliary to the successful termination of that operation. You have witnessed it twice in this

hospital, and your own observations will convince you that the operation is attended with but a trifling loss of blood, that no important parts present themselves to the knife, and that its immediate and remote effects upon the patient are of no consequence whatever.

The operation itself can, therefore, not be set down as a dangerous one. Its failure must be ascribed to pathological causes over which medico-surgical art has no control.

The details of the operation are exceedingly simple. An incision along the anterior margin of the *musculus glutaeus medius* downwards to the large trochanter, and one inch and a half beyond it, brings you upon the joint. A second cut severs the *mm. glutaei* (med. and min.) *pyriformis*, etc., from their insertions. Another opens the joint around the superior and posterior segment of the femoral head. In crossing the affected extremity to the other, as far as possible, you will readily dislocate the head, and bring it out of the wound, the *lig. teres* mostly being destroyed. With a small saw, you may easily remove as much of the diseased bone as you deem proper, but as much of the periosteum as possible should be saved, as it will supply the material for the intermediate substance in the place of the removed bone. With a chisel or rasiourum, you may then clear the acetabulum from all diseased elements, and after having lightly filled the wound with charpie, secure the patient in our apparatus.

During the first few days no extension should be employed, but as soon as the inflammatory reaction has passed off, it should be gradually assumed in order to secure the full length of the leg.

Some months are required to give the required firmness to the intermediate substance, and render it useful for locomotion. Dr. Sayre's patient could walk and jump the rope four months after the operation, with but half an inch shortening, though a very imperfect apparatus was applied to extend the limb. Michael McCarty's leg was one and three-quarter inches shorter, he resumed locomotion some three months after having been operated upon. Mary Johnston has acquired the full length of her extremity, but owing to her disposition to obesity the in-

terminated substance is not, as yet (two years after operation), firm enough to bear her weight (some 80 pounds); and to all appearance Fred. C. Schroeder will acquire almost the full length of his extremity.

Gentlemen, this closes the subject of our lecture, reserving the consideration of ankylosis, consequent upon hip-joint disease, and its treatment, for a future occasion.

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LONG ISLAND COLLEGE HOSPITAL.

(*Report by JOHN G. JOHNSON, M.D., Adjunct Surgeon.*)

Case 1.—Caries of the hip-joint—Total resection of caput femoris and partial of acetabulum—Recovery with half-inch shortening and without deformity. Frederick Charles Schroeder, a fine looking boy, aged four years and six months, was received at the institution on the 24th of June. His father died, most probably, from phthisis of the lungs; his mother, a most robust and healthy woman, is still alive. Up to the present disease, the little patient enjoyed the best possible health. Though he has repeatedly met with a fall, yet it remains dubious whether the disease has been caused by traumatic or other influences. About twelve months previous to his admittance into the hospital, a slight lameness was noticed, and the disease went steadily on until it reached its present degree. During the intervening time, the patient was attended by a physician, yet without any check to, or amelioration of the disease.

Status morbi.—Constitutional disturbance, with frequent pulse, hot and dry skin, coated tongue, thirst, want of appetite, constipation and saturated urine. During night his rest is frequently disturbed by painful jerks, that make him halloo loudly, leaving entirely free intermission of short duration. Immobility, soreness and tumefaction of and around the right hip-joint. The affected extremity is much adducted and inverted, and flexed in both hip and knee joints, which position is unalterable even by the aid of chloroform. The adductor and flexor muscles of the thigh are tense and contracted, projecting like cords. The pelvis is raised on the affected side, and turned on its transverse diameter, accounting thus for the higher position and posterior projection of the right nates as well as for the increase of the angle of inclination.

Spine is bent, both laterally and anteriorly. The lateral curvature extends over the whole spine ; the anterior curvature is located at the lumbar part, and depends evidently on the transversal rotation of the pelvis.

At the thigh, about two inches below the large trochanter, there is a small fistulous opening, from which but a small quantity of sero-purulent matter is discharged. The least motion of the joint clearly evinces crepitus. On introducing a finger into the anus, no morbid changes were discovered in the pelvic cavity.

Diagnosis.—*Morbus coxarius* in its third stage (perforation of the capsular ligament), caries of the articular surfaces, consecutive abscess and fistula and reflected muscular contraction. Dr. Bauer directed a free dilatation of the fistulous tract, to eliminate the subfacial accumulation of pus. This being done, a considerable quantity of matter, greatly decomposed and with the smell and chemical reaction of sulphuretted hydrogen, escaped; the parts were finally covered with poultice.

On the 26th of June, the patient was again closely examined under chloroform. His constitutional irritation had then greatly abated, and the free discharge of pus had relieved the joint so much as to admit flexion and extension in a limited degree, whereas adduction remained the same. The denuded condition of the articular surfaces was affirmed by repeated crepitus, perceptible both by hearing and feeling, though it seemed but limited.

The question as to treatment was in this case of intense interest. Dr. Bauer, in qualifying his views, remarked, that he had no doubt as to a carious condition of the joint. The healing process of nature was exceedingly slow and protracted. Before she would succeed in removing the disintegrated osseous fragments, the patient might become a victim to the material loss necessarily connected therewith or to pyæmia. The knife would do it in two minutes, and to all probability this would be the exigency after all. Yet as the patient had evidently improved under the treatment, was in a comfortable condition, and delay was not likely to injure his prospects, he should postpone the operation and give nature a fair chance. Any change to the worse would, however, alter his decision.

But under *all* circumstances the causes of the deformity should be disposed of, for if ankylosis should eventually ensue, the malposition of the extremity would be equal to uselessness ; and he was, moreover, satisfied that the muscular contractions with their sequels were exceed-

ingly prejudicial to the hoped-for results. Rest and proper position of the limb were, in his estimation, the best remedies in articular affection of whatever description.

The contracted muscles were accordingly divided; the limb, thus entirely relieved, was easily put in a good position, and with that the patient was secured in Dr. Bauer's wire thigh-splint. Besides the recumbent position and tonics, the best of diet was allowed, with ale, milk, etc., as drinks.

During the next fortnight the little patient's condition left nothing to wish for. He enjoyed the most perfect ease and comfort, and his appearance partook largely in his improvement, so that without close examination, nobody would have imagined that he suffered at all from so grave a disease.

These improvements thus recorded, proceeded steadily up to the 6th of August, when new symptoms of both local and constitutional disturbance set in. The environs of the joint became again more intumesced, the discharge decreasing simultaneously. Unrelenting fever with all its appurtenances devastated his system. The caries had evidently spread, judging from the extended crepitus. All that had been anticipated, had been fully verified. The time had at last arrived for active intervention.

Counsel and faculty agreeing with the attending surgeon upon the necessity of operating forthwith, if at all, as further delay would not improve the chances of recovery, the operation was performed in accordance on the 12th of August, by Dr. Bauer, assisted by Drs. Daniel Ayres, Johnson, Whaley and Dodge, whilst Dr. Byrne administered chloroform.

It commenced with an incision $2\frac{1}{2}$ inches above the large trochanter, vertically descending $1\frac{1}{2}$ inches below the same point and down upon the joint. The insertion of the glutæus muscles was then severed and the joint entered by a semi-circular incision along the acetabulum. Ligamentum teres being already destroyed, there was no difficulty in dislocating the head of the femur and pushing it far enough through the wound to be sawed off—for which object the limb was strongly adducted and placed cross-wise with the other. But having ascertained that the caries descended more downward at the inside of the neck, an additional piece of bone about $1\frac{1}{4}$ inch in length was stripped of its periosteum and then also removed, so that the entire apophysis was taken away below the small trochanter. The acetabulum was subsequently scraped and cleared of all detritus,—the wound loosely

filled with fine charpie, the patient replaced in his thigh-splint, with sufficient firmness as to retain position undisturbedly, and taken to bed. There was no bleeding worth speaking of, and no ligature was required. When examined, the caput femoris was found to be greatly diminished in size, brittle and carious along the neck down to the small trochanter, but the acetabulum was but slightly damaged.

During the subsequent days a moderate reaction ensued, but as to the local condition the patient felt perfectly comfortable. He has ever since progressed favorably and greatly improved in appearance and weight. By means of the said thigh-splint—by the way, a most invaluable invention for like cases—his leg has been kept well extended, so that its length is but half an inch deficient. The position is also good and the patient can raise it without difficulty. The wound is healed up to the size of a small pea, and is filled with healthy granulation and it discharges good and plastic pus. As yet the patient has not been permitted to stand or walk on his operated extremity, for obvious reasons, for the intermediate substance formed between the femur and the acetabulum is not yet sufficiently consolidated to bear the weight of the body. Whether the latter will be entirely of fibrous, or in part or entirely of osseous structure, and whether it will articulate or closely connect with the acetabulum, has not as yet been ascertained.

Case 2.—Arthromeningitis coxae traumatica.—Failure of constitutional and derivative treatment.—Cauteria useless and prejudicial—Violence of reflex symptoms—Their final subjugation by rest, position, division of contracted muscles and strychnine.—Richard Trottman, a boy five years and nine months old, came under charge of Dr. Louis Bauer on the 1st of September. His parents and relatives are strong and robust, and their health unexceptionable. Until his arrival in this country, Richard has been a strong, lively and healthy boy. His vivacity has often made him subject to accidents, yet he has never been hurt much. Some $2\frac{1}{2}$ years ago, he fell into a basement and was badly bruised thereby; and although it remained uncertain whether his present disease was at all attributable to that cause, certain it is that, a few months after, he commenced limping and to complain of soreness in his right hip joint. The symptoms became gradually so intense as to alarm his parents. Medical aid was thus early procured, when it was advised to lay the child up, to blister and leech the affected joint; internal remedies were likewise resorted to. Nevertheless the disease, then pronounced to be hip-joint disease, grew worse, when moxæ and at

last actual cautery where applied. All this, however, did not arrest its progress. The child, when reduced to a skeleton, and his constitution utterly ruined, was at last placed under care of Dr. Bauer.

Status morbi.—Great excitability and fear of examination; very much emaciated, pallid, and feeble; pulse 135 in a minute; skin hot and dry; tongue red, slightly furred; great thirst and no appetite. Slight tympanitis and irregular bowels, constipation alternating with diarrhoea. Urine very much saturated, weighing 1017, as compared with water. No albumen, but abundance of uric acid and urates. Respiration accelerated, but lungs in healthy condition.

Right limb much bent in both hip and knee-joint, at the same time abducted and everted. Apparent elongation of affected extremity, with lateral declivity of pelvis; flattened nates with three circular cicatrices posteriorly to the joint. Perfect immobility and painfulness of the right hip joint, more particularly on motion and pressure. Indistinct fluctuation along the posterior edge of the acetabulum, and of no great extent. Flexors and adductors dense and shortened, even under chloroform. All motions are being made on the healthy hip and the vertebral articulations, pelvis partaking in them. No morbid changes inside of the small pelvis, near the acetabulum.

It was furthermore ascertained that patient was almost entirely deprived of rest, the latter being constantly interrupted by sudden pains that put his limb into a regular tremor.

There being no other morbid changes about the joint and adjacent parts, the disease was pronounced to be *arthromeningitis coxae traumatica*, 2d stage.

Prognosis not entirely unfavorable, the effusion being but moderate and not as yet purulent.

Treatment.—Liberal diet with milk, strong beef-tea, or good ale, as drinks; iodide of iron and quinine alternately, cod liver oil, etc. To commence with a mercurial aperient and 4 leeches at the affected joint.

Sept. 2d. Division of adductors and tensor vaginæ femoris, whereupon the extremity would be extended and slightly moved at the hip-joint. Patient placed in a wire-splint. 12th.—During the last ten days Richard has greatly improved. Appetite better, rest undisturbed and appearance changed favorably, more particularly in color and bulk. Pulse yet accelerated, especially during the visits. Treatment as before and to be continued.

Oct. 4th.—Since previous day, patient has complained of more soreness in the joint. He is more feverish and his appetite is lessened; his

rest has again been disturbed. Leeches to be applied and morphia at night if required. 14th.—No relief despite local depletion and morphia. On examination some bundles of the pectenæus muscle were found to be tense and unyielding ; their division decided on and executed. 15th. Rest and comfort undisturbed.

October 29th.—Again some uneasiness. Slight soreness in the joint, considerably augmented when moved. Moderate constitutional excitement. Antiphlogosis ; leeches, unguentum hydr. cin. with sedatives.

October 30th.—Symptoms increased, although the movements of the joint are easy and almost without pain. Pushing the femur against the acetabulum continues painful. Most prominent are the nocturnal pains. Patient halloos every five or ten minutes during the whole night, disturbing every one in the room. Ordered large doses of morphia to be given repeatedly when necessary, until rest is procured.

October 31st.—Change rather for the worse ; treatment continued.

Nov. 1st.—No abatement of symptoms. Again leeches (4). 2d.—*No change.* Prescribed strychniæ nitras in combination with morphia. 3d.—Better in every respect. 18th.—Has steadily improved up to present date ; no pains about the affected hip-joint either on pressure or motion. Good position and normal length of extremity. Constitutional condition satisfactory, and nocturnal pains vanished entirely. The patient permitted to sit up in his wire hose and take moderate exercise on crutches.

The items of the following cases have been taken from the private records of Dr. Bauer, which I give in his own words :

Case 3.—Diastasis of the femoral head—Its spontaneous expulsion through the thigh—Subsequent caries of the neck—Resection—Recovery. November, 1856. When at Cincinnati was invited by two of the leading surgeons of that city, to see a girl nine years old, suffering, to all probability, from hip-joint disease. They informed me that two years previously the child had fallen off a swing and hurt her right knee. Whilst under treatment for that injury she began at once to complain of pain in left hip-joint, the circumference of which was found to be intumesced and the limb moderately shortened. There was no trace of external injury. In the course of eight months an abscess formed in the front of thigh, discharging successively some shells of bone. She remained invalid all the time and had to be carried about. No relief had been obtained from various treatment.

On seeing her, found a well and blooming looking girl with remarkable obesity. Left extremity $1\frac{1}{4}$ inch shorter, turned outside, but otherwise in good position. Pelvis square ; joint painless on moving and pressing, could push the extremity upwards and pull it down, thus decreasing and increasing its length. Crepitus on rotation. In front inverted fistulous opening of the size of a five cent piece; at its bottom sounded bare bone. Diagnosis—caries of apophysis of femur, head already gone, which met the approbation of the attending surgeons.

Proposed the resection of the carious bone ; acceded to ; performed the operation by single incision, dislocating the femur, sawing off the carious neck, and closing the wound by suture. No communication could be detected between the joint and fistulous opening, and it was, therefore, premised that the head might have been ulcerated through the capsule and still remain in the soft parts. Under this supposition, dilated the fistulous opening, took hold of the bone at its base and removed it. Though somewhat altered in shape by the constant action of pus, it could not be mistaken for anything else than the anatomical head, having parted at its cartilaginous juncture from the neck.

Thus far my diagnosis was corroborated by the condition of the neck of the femur being found carious and decapitated. Cannot look upon the case as hip-joint disease, almost all symptoms being absent characterizing that malady. Think that a diastasis was produced by the fall, but the patient being immediately taken to bed, prevented the displacement for some days, and then it was overlooked. The constant irritation of the parts by moving or perhaps the working of the head through the capsule brought on caries of the neck.

Have seen the patient since ; the wound is firmly closed, but the intermediate substance is yet too soft to bear the weight of the body, owing perhaps to her peculiar constitution that turns all food into fat. Ordered phosphates of lime, soda and iron.

Case 4.—Synovitis of left hip-joint—Progress of disease to caries—Perforation of the capsular apparatus—Exsection of caput femoris—Recovery.

June, 1855.—Received at the institution Michael McCartery, a former patient of Dr. Jarvis, Portland, Conn., who sent him on ; a fine boy, three years old, fair constitution. Mother a strong Irish woman ; father died of causes unknown. Had sustained a fall and limped ever since. All evidences of synovitis with effusion. Local antiphlogosis

and rest in Hagedorn-Dzondi's apparatus (inefficient, don't know a better one as yet). Disease progresses steadily (Aug.) In October, 1855, abscess forming about the hip ; made free incision, relieving the patient materially. Detected crepitus in joint ; decided upon the exsection of the carious bone ; performed the operation with comparative ease. Found head of femur and acetabulum diseased ; scraped the latter. Put the patient back in the foresaid apparatus. Great trouble in dressing ; does not secure the rest of the limb, nor prevent its shortening. Wound granulates kindly and fills up. 1856.—Discharged patient as cured with about two inches shortening. Intermediate substance very short, but firm ; seems to articulate with the acetabulum.

Case 5.—Rheumatic periostitis of femur—Great similarity to hip-joint disease—Difficulty of diagnosis.—Service of Drs. BAUER and WHALEY, William A. Marshall, aged eleven years, entered the hospital, November the 10th, 1858, giving the following history and symptoms :

He has always been a remarkably healthy boy. Four months ago, being then at a boarding school, he took a bath in a pond of fresh water. He had previously been playing about, and got in a profuse perspiration, when he jumped into the water. Did not experience any immediate bad effects therefrom. Next day, however, felt pain in his right hip, like "cramps," and could not lie on that side. Three days after could not leave bed. Two physicians pronounced it hip-disease, and told him he would recover with shortening of the limb.

Being carefully examined by the attending surgeon, it was found that the pelvis was raised, spine inflexed, nates very convex, plica higher, linea inter nates deviating from perpendicular, limb much flexed both in hip and knee, so much adducted as almost to cross the other, toes inverted, and the extremity thus apparently shortened some four inches. Joint moveable; neither tender on pressure, forcible extension or compression. The upper third of the femur much enlarged, and very tender (exclusive apophysis).

Under chloroform the contracted muscles unyielding. General health tolerable, although there is some emaciation of the whole body, to be ascribed to pains, want of rest and constitutional derangement. Dr. Bauer sets the case down as rheumatic periostitis of the femur, for the following reasons :

1. Bone is enlarged and tender on touch.
2. The cause is such as often to produce that disease with rheumatic character.

3. The joint is perfectly free.

4. The deformity, though very like that of hip-joint disease in the third degree, has been the same since the commencement, which is not the case in the latter, being preceded by apparent elongation, abduction and eversion of the effected extremity.

It was, however, admitted that the differential diagnosis of the like cases was exceedingly subtle, and errors are not only frequent, but excusable. Chloroform is indispensable for correct diagnosis in such cases.

For the relief of tension, a three-inch incision was made, which confirmed the opinion of Dr. Bauer, the bone being much enlarged, very dense, eburnated.

November 30th.—Since the incision has been performed, the patient has felt great relief, and his constitutional condition has obviously improved. It was decided to divide the muscles, and to reëstablish proper position and length of the extremity, which operation was accordingly performed by Dr. Bauer, whereupon the patient was placed in the "wire breeches."

At present (Dec. 8th), his form is good as well as his general health. He will leave the institution in a few days to await the reparative process nature may choose to employ. The case has been reported in connection with those on hip-joint disease, on account of the interest it presents with reference to diagnosis.

Case 6.—Arthro-meningitis coxae traumatica—Effusion in the joint (second degree of hip-joint disease)—Violence of reflex symptoms—Their prompt subjugation by subcutaneous opening of the articular cavity, division of contracted muscles, rest and good position of the affected extremity in the thigh splint of Dr. LOUIS BAUER.—Maria Tuthill, a bright and handsome little girl, four years and nine months of age, was brought as an in-patient to the College Hospital, and placed under the care of Drs. Bauer and Dodge on the 4th Aug. last.

A mere superficial glance would have impressed the observer with her being perfectly healthy, so strong and robust was her appearance. She was well nourished and rather fat; her cheeks and lips were as rosy and her expression as happy and contented as to suppose her free from any trouble whatsoever. Having sustained a fall from a chair about six months previous to her reception, she immediately after commenced limping and complaining of pain about the right hip. Despite very attentive medical treatment the little patient grew steadily worse, until she arrived at her present condition.

Examination.—Declivity of pelvis towards right, projecting forward; simple lateral curvature of the spinal column towards the same side; plica natis lower, the latter flattened; linea inter nates oblique; right limb abducted, everted and strongly bent in hip and knee joints; heel raised half an inch from the ground; joint excessively tender on touch; very little mobility in the direction of flexion and extension, but more lateral; behind caput femoris there is a moderate and fluctuating protrusion of the capsular ligament clearly discernible by every member of the medical staff. Abductors and tensor vaginæ femoris very tense and contracted; right thigh half an inch smaller than the left; locomotion very difficult and limping. Maria puts her foot flat forward and outward on the ground and draws the left leg after (diagonal walk); right shoulder higher and forward.

The malposition of the right extremity remains unaltered under the full effects of chloroform. No crepitus discernible in the joint; pelvic cavity free from disease. General condition good; no fever of any account, but slight diminution of appetite. In addition, it was ascertained from her mother that she was restless during the night, skin hot and dry, partaking freely of cold drinks. Moreover, she was often-times awakened by sudden pains, and would then scream out, but soon again resume sleep. There had been at no time any pain at the knee-joint.

Diagnosis as above specified. Prognosis favorable, on account of the good constitution of the patient, the local origin and short duration of the disease, and the absence of osseous disintegration.

An aperient and the application of three cups directed, to commence with.

August 5th, A.M.—The nurse reports that Maria had passed a very restless night, had slept but little, asked constantly for cold water, been very hot, dry and feverish, and repeatedly shrieked so loudly and violently as to frighten the other patients in the children's ward. Pulse still accelerated, face hot and flushed, urine high-colored, and tongue coated, no appetite for breakfast.

The aggravating phenomena being chiefly ascribed to the violence of reflex action, superinduced by the tension of the articular capsule, it was decided to open the latter subcutaneously, after Goyrand's plan, and to divide also the contracted muscles. The operation was performed accordingly by Dr. Bauer, and with the aid of chloroform, after which the limb could be moved in any direction; the fluctuation had vanished also, and the patient was then fixed in the wire apparatus.

Aug. 6th.—Entire absence of pain ; motion of joint easy, and without crepitus; limbs of equal length; had passed a comfortable night. 13th.—Since last record, patient has presented no noticeable symptoms. Has ever since slept well ; enjoyed the most unqualified cheer and appetite, and she may be fairly pronounced well as far as her constitutional health is concerned. Local pain gradually decreasing.

Sept. 3d.—Taken out of the wire apparatus and carefully examined ; general health, good ; but a slight soreness remaining at the joint. No malposition of the limb, no fluctuation or crepitus at the joint.

In this condition the patient was discharged, Oct. 12th, at the request of her relatives.

Case 7.—Synovitis of the hip joint (third stage)—Contraction of tensor vaginæ femoris and the group of adductor muscles—Relieved by myotomy and rest to the articulation.—(Service of Drs. BAUER and WHALEY.)—Ann Smith, a little girl, 5 years of age, and of tolerably healthy appearance, was received into the hospital on 5th of July, with an affection of her right hip. She was of Irish descent ; her father had died of phthisis ; her mother is a healthy and robust woman. Twelve weeks previous to her admittance she had fallen down stairs and hurt herself. Soon after she complained of pain in hip and began to limp. Sometime after, an abscess formed behind the joint, when she felt slightly relieved. Becoming, however, gradually deformed, she was placed in the Institution.

Examination.—Soft parts of affected joint intumesced ; behind it a fistulous opening of the size of a pea, discharging a clear, soapy liquid, mixed with pus. Opening movable, neither inverted nor everted ; indistinct fluctuation surrounding it. Limb shortened about 3 inches, attenuated, flexed in hip, adducted and inverted. Tensor and adductors strongly contracted. Pelvis raised on right side, and simple lateral and anterior curvature. Great pain on moving and pressing the articulation, but no nocturnal pain. Adjacent bones neither enlarged nor tender on touch. General health, tolerable ; moderately emaciated. Appetite and rest, fair.

In considering the case, Dr. Bauer thought, that there could be no doubt as to the traumatic cause ; serofulvous diathesis being marked neither by the present appearance of the patient or the history of her past life. The absence of crepitus indicated mere synovitis of the joint, the result of contrecoup. Most probably the perforation of the capsular apparatus, posteriorly, had been effected a month ago, and it was strange that an indifferent effusion should have given rise to the formation

of an abscess in the areolar tissue, perhaps still connected with and supplied by the morbid secretion of the joint. The case belonged clearly to the third stage of hip disease, of which all attributes were manifested.

Treatment.—Local depletion by cupping, followed by the dividing of the contracted muscles. Rest of the articulation in the wire apparatus with proper position of the extremity. In fine, the best of diet, with tonics.

The operation thus delineated, was performed by Dr. Whaley with perfect success, the limb easily extended and secured as aforesaid.

From this time patient did well. Pain left off, the parts surrounding the joint gradually returned to their normality and the fistulous opening closed also. In August she was permitted to take some exercise in the walking apparatus, and September the 27th she was discharged, with perfect form and but little soreness of the joint when moved separately.

Case 8.—A little boy, 7 years 3 months of age, of feeble, pale, and emaciated appearance, was admitted June 5th, under charge of Drs. BAUER and DODGE. He is of English parentage, his father perfectly healthy, his mother also, except being occasionally troubled with a cough. One of their children is subject to epilepsy, but their youngest offspring presents all the attributes of a robust constitution.

Johnny has always been a feeble and sickly child—about a year before his admission to the hospital he sustained a fall, coming down with one knee under him, the other extremity slipping away. Soon he began to complain of pain about the knee, and shortly after was noticed to limp.

On admission, the patient was carefully examined whilst under the influence of chloroform, and the following notes taken. Some constitutional trouble, fever, skin hot, dry and inactive; pulse irritable, quick, and weak, 115 a minute; tongue coated, with red edge and tendency to dryness; thirst increased, appetite diminished; alvine evacuations irregular—either costiveness or diarrhoea. His features bore the mark of violent pain and agony—pallid face and colorless lips, with the additional signs of anaemia; respiratory organs free from disease; abdomen distended and tympanitic; the liver of larger size; remaining organs normal; urine containing no albumen, or any other evidence of derangement.

Right extremity almost perfectly immovable (at least, in as far as

abduction and adduction are concerned); flexed in both hip and knee-joint, slightly everted and adducted contractions of flexor vag. fem. and also, to a moderate degree, of adductors. Attempt at moving the right hip-joint excessively painful, as well as pressure on its circumference—more particularly, however, behind—at the latter point, fluctuation was clearly discerned along the semi-circular line of the acetabulum. Although the pelvis presented great obliquity, and was therefore lowered on the affected side, the limb, nevertheless, and by virtue of its flexion, was considerably shortened.

Diagnosis.—Hip-joint disease in second degree, with effusion within its articular cavity.

Whether ulceration has already been established, and more especially the articular surfaces denuded from their respective cartilages, is a question to be decided after abstraction of the effusion by puncture or absorption. The effusion, however, not being considered of any great amount, it was decided to place the leg in Dr. Bauer's wire splint, and by securing perfect rest and position, to give the effusion a chance for absorption.

In order, however, to extend the leg, Dr. Dodge was requested by the attending surgeon to divide the ext. vag. fem. This therapeutical proceeding, supported by appropriate constitutional treatment, had not the desired effect of allaying pain and fever, both continuing progressively up to the 22d of same month.

The pain was not only local and continuous, but periodical and violent, very like electric discharges through the whole course of the nerve, disturbing the patient's rest at night, and causing him to shriek out with such vehemence as to be heard throughout the establishment.

Dr. Bauer then proceeded to enter the joint by a small trocar, posteriorly and superiorly to the large trochanter, by means of which he abstracted purulent fluid, which released the immobility of the joint, and on motion, the denuded condition of the bones was clearly proved by crepitus. This seemed to give some slight relief, but very soon, the symptoms, both constitutional and local, increased in violence, fluctuation being discernible all around the joint, and the system failing fast—under these circumstances, consultation was held with the other gentlemen of the medical staff, and the free opening of the joint, together with the removal of all carious bone, decided upon, although but temporary relief could be expected. The operation was accordingly performed, and in entering the articular cavity, Dr. Bauer found not only the head of the femur and acetabulum denuded, but the latter also per-

forated. The caries were of particularly soft nature, having the consistency of cheese, although no tuberculous infiltration could be discerned by the naked eye. The operation had, thus far, the desired effect—it procured the most perfect comfort to the patient, with immunity from pain, and he enjoyed the best rest, and a tolerably good appetite almost to the last. The wound never closed, and discharged continuously a sanguous pus ; the prostration of the system by this constant drainage, increasing in proportion ; troublesome bed-sores made their appearance, and diphtheritic membranes through the intestinal tract preceded his death two months. He expired four months after the operation.

At the post-mortem merely the condition of the joint was examined ; the acetabulum was found softened throughout, and perforated by an opening sufficiently large to allow the passage of the thumb ; the shaft of the thigh-bone was carious, and softened to the extent of two inches, and the soft parts were in an appropriate condition.

